SOIL SURVEY

of

SHELBURNE COUNTY

Nova Scotia

J. I. MacDougall and D. B. Cann
CANADA DEPARTMENT OF AGRICULTURE
and
J. D. Hilchey
NOVA SCOTIA DEPARTMENT OF AGRICULTURE

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CONTENTS

PAGE

Introduction 7
General Description of the Area 7
Location and Extent 7
Settlement and Population 7
Transportation and Markets 8
Industries 9
Factors Affecting Soil Formation in Shelburne County 9
Climate 9
Parent Materials 11
Vegetation 12
Topography and Drainage 13
Erosion 13
Time 13
Classification and Descriptions of the Soils 13
Soil Development 13
Soil Survey Methods 14
System of Classification 14
Descriptions of the Soils 17
Soils Developed from Moderately Coarse-Textured Parent Materials .. 17
Mersey Series 17
Liverpool Series 17
Pitman Series 18
Halifax Series 19
Danesville Series 19
Gibraltar Series 20
Bayswater Series 20
Aspotogan Series 21
Port Hebert Series 22
Lydgate Series 23
Roseway Series 23
Soils Developed from Gravelly Sandy Loam Stratified Parent Materials 24
Medway Series 24
Soils Developed from Organic Materials 25
Rossignol Sedge Peat 25
Sphagnum Peat 25
Miscellaneous Soils 26
Swamp 26
Salt Marsh 27
Coastal Beach 27
Agriculture and Land Use 27
Present Land Use 27
Land Use Capability 28
Soil Ratings 32
Discussion of Analytical Data 33
Carbon and Nitrogen 34
pH and Lime Requirement 34
Silica, Sesquioxides, Total and Free Iron 34
Calcium, Potassium, Magnesium and Phosphorus 34
Cobalt 34
Summary 36
Glossary 36

LIST OF ILLUSTRATIONS

		PAGE
1.	Areas of soil surveys in Nova Scotia (map.)	6
2.	Population of Shelburne County, 1871-1956 (chart).	7
3.	Outline map of Shelburne County	8
4.	Fishing is one of the principal industries	9
5.	Potential evapotranspiration representative of the surveyed area (charts)	11
6.	Geological formations (map)	12
7 & 8.	Mersey soils	16
9.	Gibraltar soils	21
10.	Medway soils	25
11.	There are large areas of peat in Shelburne County	26
12.	Land use capability classes (map)	29

LIST OF TABLES

		PAGE
1.	Average temperatures and precipitation	10
2.	Average dates of frost and numbers of frost-free days	10
3.	A key to the soils	15
4.	Acreages of soils	15
5.	Acres of farm land in various uses	27
6.	Acres of field crops	27
7.	Types and numbers of livestock and poultry	28
8.	Forest inventory: areas in various land classes	28
9.	Soils in Class III	30
10.	Soils in Class IV	31
11.	Soils in Class V	31
12.	Soils in Class VI	32
13.	Soils in Class VII	33
14.	Suitability for production of selected crops of soils in land use Classes III and IV	33
15.	Chemical and physical analyses of three representative soil profiles	35
16.	Available nutrients in soil profiles	36

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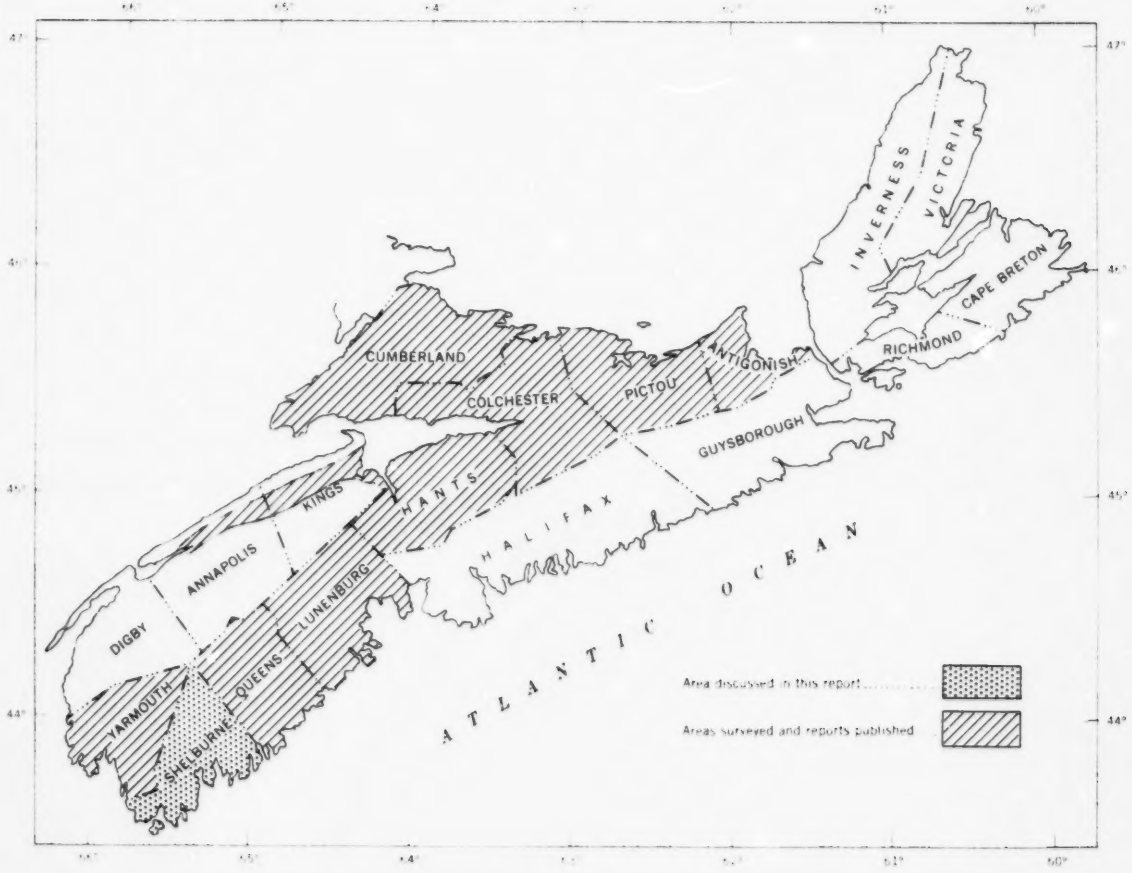

FIGURE 1.—Areas of soil surveys in Nova Scotia.

INTRODUCTION

The purpose of a soil survey report is to describe the soils of an area and their relation to agriculture. This report deals with the soils of Shelburne County. Most of it comprises descriptions of the characteristics of the various soil series.

A soil map showing where the various soils are found in the county accompanies the report. Each soil may be identified by the color and symbol shown in the legend. The topography and the amounts of stone are also indicated on the map by means of symbols. Details about any soil shown on the map may be obtained from the text.

This report also contains useful information for those interested in forestry, land use planning, highway construction or use of the land for recreation.

GENERAL DESCRIPTION OF THE AREA

Location and Extent

Shelburne County is between 43°20′ and 44°15′ north latitude and between 64°50′ and 65°50′ west longitude, in southwestern Nova Scotia (Figure 1). The southern boundary of the county is the Atlantic Ocean. On the east and northeast it is bounded by Queens County and on the west and northwest by Yarmouth County. The greatest distance from east to west is about 32 miles and from north to south abou. 50 miles.

The total area of the county is 993 square miles, or 635,532 acres, including 46 square miles of lakes and rivers.

Settlement and Population

One of the earliest settlements in Nova Scotia was established at Port la Tour, named after Claude de la Tour and his son Charles, who settled there about 1624. Scattered French settlements developed along the coast, chiefly at the entrance to Shelburne harbor and Barrington.

At the time of the expulsion of the Acadians the area was vacated by white men. In 1765 settlers from New England built a town on the Roseway River on what is generally believed to be the site of the present town of Shelburne. When government subsidies, which stimulated the development of Shelburne,

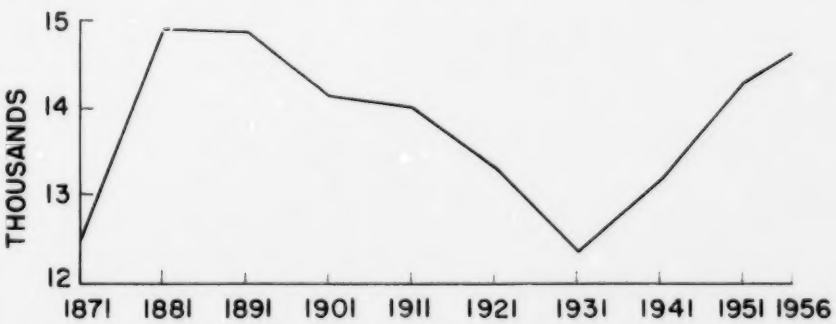

FIGURE 2.—Population of Shelburne County, 1871-1956.

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were withdrawn, many of the Loyalist families moved away. It was not until thriving industries of fishing, lumbering and shipbuilding were started that prosperity returned to the area.

The trend of population between 1871 and 1956 is shown in Figure 2. The population of Shelburne County reached a peak of nearly 15,000 between 1880 and 1890. A decrease in population started with the decline in wooden ship construction. Between 1911 and 1931 the decrease can be attributed in part to emigration to the United States and Ontario. The economic depression later slowed the flow of Nova Scotians to the United States and since 1931 the population has gradually increased. In 1956 the total population of Shelburne County was 14,604, the farm population being 347.

Transportation and Markets

Transportation facilities of Shelburne County are concentrated largely within 10 miles of the coast. The Canadian National Railway line from Halifax to Yarmouth runs through the southern part of the county and serves Lockeport, Jordan Falls, Shelburne, Clyde River and Barrington as well as other towns. There are no branch lines in the area.

FIGURE 3.—Outline map of Shelburne County showing principal streams, towns, roads and railways.

Areas not served by the railway depend upon a network of highways and secondary roads. A paved highway that connects Halifax and Yarmouth touches most of the towns and villages along the coast. Unpaved secondary roads connect the smaller inland communities with the larger centers.

Figure 3 shows the principal towns, roads and railroads. Shelburne has one of the best natural harbors in Nova Scotia and is the principal port of the area. Numerous harbors along the coast provide shelter for the many fishing fleets and for smaller boats.

The farm products of the county are consumed locally. Most foods are imported.

FIGURE 4.—Fishing, which also provides employment in boat-building, is one of the principal industries.

Industries

The principal industries of Shelburne County are lumbering and fishing (Figure 4). There are fish-processing plants in Shelburne town, Clarks Harbor and Lockeport. Curing of Irish moss, boat- and ship-building, and furniture manufacture are important industries in the Shelburne area.

FACTORS AFFECTING SOIL FORMATION IN SHELBURNE COUNTY

Soils are affected by such factors as climate, vegetation, topography, drainage, erosion, time and the parent material. The interaction of these factors gives rise to different soils, which may be grouped or classified according to their characteristics in a vertical section known as the soil profile.

Each of these soil-forming factors, as it applies in Shelburne County, is briefly discussed below.

Climate

The climate of Shelburne County is humid temperate. The county has no weather station, but the climate is very similar to that of Queens and Yarmouth

counties. The Yarmouth weather station is about 40 miles west and the Liverpool station about 36 miles east of Shelburne town. Long-term climatic data are available for these stations and are used here as being applicable for the coastal areas of Shelburne. In general the climate along the coast is modified by the Atlantic Ocean. Inland, summer temperatures are higher and winter temperatures lower. About one third of the annual precipitation falls during the growing season, which ranges from 170 to 190 days.

Tables 1 and 2 show average climatic data for two stations representative of the area. The data were compiled from reports of the Meteorological Division, Department of Transport.

TABLE 1.—AVERAGE MEAN MONTHLY AND SEASONAL TEMPERATURES AND PRECIPITATION AT TWO STATIONS REPRESENTATIVE OF SHELBURNE COUNTY

	Liverpool, 26 years		Yarmouth, 59 years	
	Temperature °F.	Precipitation inches	Temperature °F.	Precipitation inches
December	29	5.82 (10.6)[1]	31	4.88 (15.7)
January	24	5.68 (16.5)	26	4.49 (20.6)
February	23	5.61 (21.9)	26	4.24 (21.8)
Winter	25	17.11	28	13.61
March	30	4.60 (11.6)	32	4.17 (13.1)
April	39	5.04 (4.7)	40	3.44 (5.3)
May	49	4.11 (0.2)	48	3.51 (0.1)
Spring	39	13.75	40	11.12
June	57	4.67	56	2.99
July	64	4.33	61	3.38
August	63	4.51	61	3.47
Summer	61	13.51	59	9.84
September	57	4.10	56	3.59
October	49	5.76 (0.1)	49	4.15 (0.2)
November	39	5.31 (1.7)	40	4.12 (3.2)
Fall	48	15.17	48	11.86
Year	44	59.54 (67.3)	44	46.43 (80.0)

[1]10 inches of snow (in parentheses) = 1 inch of rain.

TABLE 2.—AVERAGE DATES OF FROST AND NUMBERS OF FROST-FREE DAYS IN FOUR LOCALITIES REPRESENTATIVE OF THE SURVEYED AREA

	Feet above mean sea level	Years of records	Frost-free days	Last spring frost[1]	First fall frost[1]
Liverpool, town	15	10	151	May 11	Oct. 19
Liverpool, N.S. Power Commission	50	38	107	June 3	Sept. 18
Yarmouth, town	101	61	160	May 7	Oct. 14
Yarmouth, Airport	136	11	176	May 3	Oct. 26

[1]32° F. or lower.

Thornthwaite[1] has devised a method for determining the effectiveness of precipitation. Values for the areas, calculated by his method from the average temperature and moisture data for the two stations, are shown in Figure 5. They show that in an average year there is no moisture deficiency during the summer months.

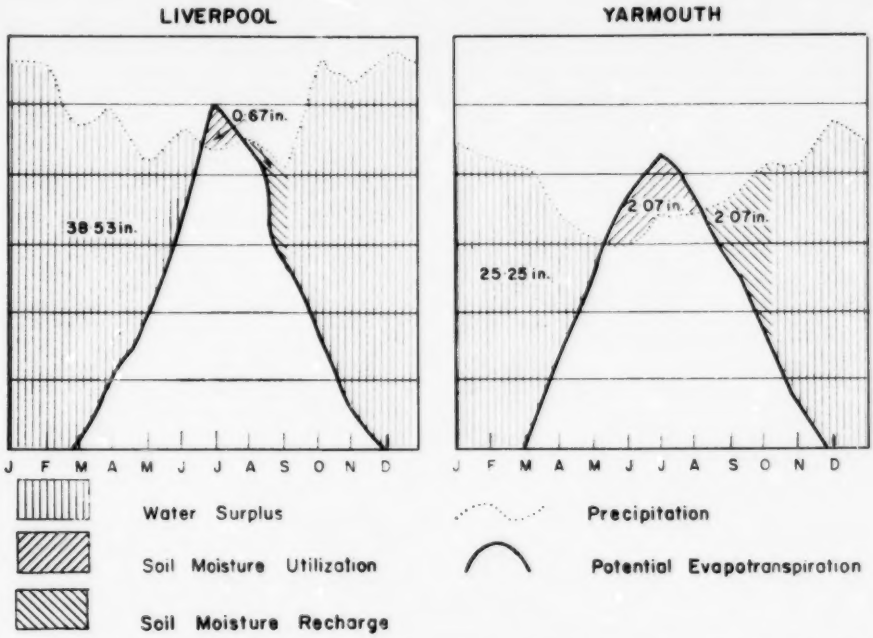

FIGURE 5.—Potential evapotranspiration representative of the surveyed area; calculated by Thornthwaite's method from data at Liverpool and Yarmouth.

Parent Materials

About 90 per cent of the soils of Shelburne County have developed from glacial drift. The remaining 10 per cent are organic deposits and very small areas of recent marine deposits. The underlying rock formations from which most of the parent materials are derived are granite, quartzite and slates or their metamorphic equivalents (Figure 6). The glacial drift over the whole county is shallow and bedrock formations often outcrop. As a result, all of the county is very stony. The quartzites and slates of the area are highly metamorphosed into gneisses and schists by the granite intrusion. This is particularly true around Lockeport and Shelburne, where mica, staurolite and garnet schists occur.

Parent materials derived from granite have a coarse, sandy loam texture and are pale yellow. The deposits are shallow, and large boulders litter the surface. Water percolates rapidly through the material and soils tend to be droughty. Parent materials derived mainly from quartzites are olive in color and have a sandy loam texture. They are stony and shallow but have better water-holding capacity than those developed from granite. Parent materials derived largely from schists are olive yellow or olive gray and have a sandy

[1] Thornthwaite, C. W. An approach towards a rational classification of climate. Geogr. Rev. 38: 55-94. 1948.

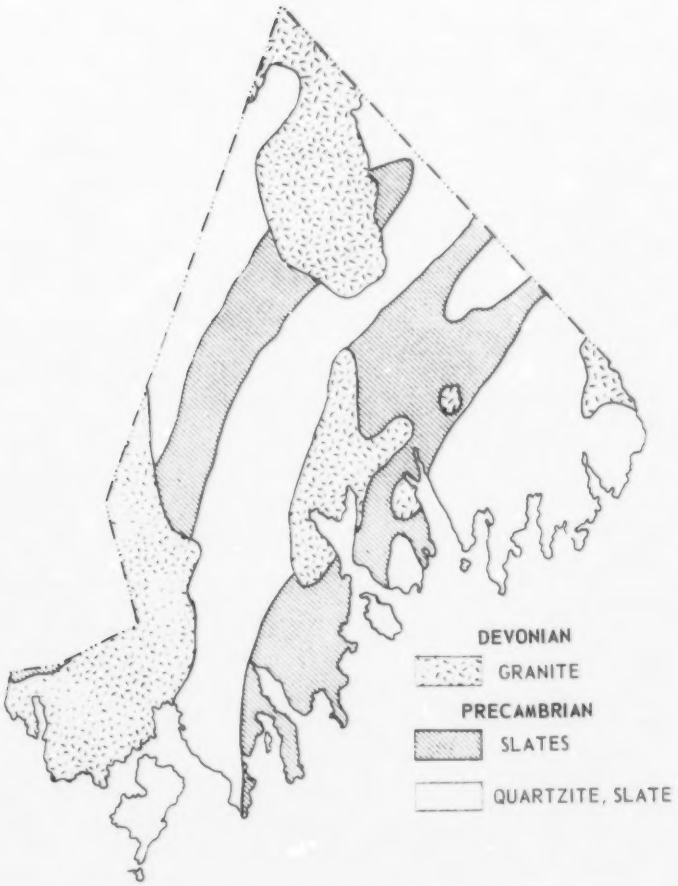

FIGURE 6.—Geological formations of Shelburne County.

loam texture. These parent materials are also very stony, but are deeper and develop somewhat deeper soils than those on materials derived from quartzites or granite.

Much of the county was greatly affected by the action of glacial melt waters. Kames, eskers, terraces and outwash materials are widely scattered. In addition, there is evidence that much of the nonstratified drift has been water-worked.

Vegetation

Over 90 per cent of the area of Shelburne County is forest, bog or fire barrens. Forest trees in the coastal regions are largely black or red spruce, often stunted in growth. Inland areas support a mixed deciduous-coniferous tree cover. Red spruce, red oak, white oak, red pine, white pine, yellow birch and hemlock grow on the better-drained areas. Black spruce, tamarack, wire birch, poplar and alder predominate on the poorly drained areas. Almost 10 per cent of the county is peat bogs of varying depths where sphagnum moss, cotton grass, sedges, club moss and cattails grow.

Much of Shelburne County has been burned over repeatedly after lumbering operations. The fires destroyed the organic matter that had accumulated on the surface of the soil. The infertile, shallow, coarse sandy loam remaining is excessively drained and droughty and, consequently, reseeding and forest growth are very slow. The climate favors rapid growth of heath plants such as blueberry, lambkill, sweet fern, crowberry and huckleberry. This type of vegetation is the first to invade fire burns and because it rapidly builds up an acid peaty layer of humus it further slows reseeding of forest. Hundreds of acres of Shelburne County have such vegetation.

In the few cultivated areas, the grasses grown for hay are timothy (*Phleum pratense*), red clover (*Trifolium pratense*) and brown top (*Agrostis tenuis*). Pasture grasses are brown top, red fescue (*Festuca rubra*), couch grass (*Agropyron*) and poverty grass (*Danthonia spicata*). Often present are blue-eyed grass, greenbrier, bladderwort, goldenrod, spiraea, wild raspberry and blackberry. In the wetter areas, spike rush, bog fern, bulrush, club moss and sedges are the dominant vegetation. Salt marshes along the coast support sea blite, saltwort, rockweed and broad-leaved species.

Topography and Drainage

Shelburne County is part of the southern upland of Nova Scotia. The surface is a gently undulating plain less than 500 feet above mean sea level at the northern boundary. This upland slopes gradually to the south and southwest, about 15 feet per mile.

The area has many low, irregularly shaped ridges, often unforested and rarely rising more than 50 feet above the level of the surrounding country. Between these ridges are depressional areas usually occupied by peat bogs and sluggish streams. Large boulders, from 1 foot to 20 feet in diameter, are strewn over the surface. The quartzite areas, though much alike, tend to be more hummocky than those derived from other rocks.

The main streams draining Shelburne County (Figure 3) are the Sable, Barrington, Jordan, Roseway and Clyde rivers. These have their sources in the central highlands of Queens, Shelburne and Yarmouth counties and all flow south to the Atlantic Ocean. They drain the numerous lakes and bogs in the interior and none are navigable except by canoe.

Erosion

Accelerated erosion often results from man's disturbance of the natural factors that keep it in check. He removes forests, and clears and cultivates land susceptible to erosion, without proper conservation practices. Only a very small part of Shelburne County has been cleared and is cultivated, and erosion is not a problem. The rapid growth of heath-type vegetation protects burned-over areas.

Time

The ice sheet of the last glacial age is believed to have receded from Shelburne County at least 15,000 years ago. Since then the parent materials of the soils have been subjected to the forces of soil formation. All the soils of the county are mature and are in equilibrium with their environment.

CLASSIFICATION AND DESCRIPTIONS OF THE SOILS

Soil Development

Interaction of soil-forming factors in Shelburne County produces soils called Podzols. A podzol soil is characterized by a surface layer of organic matter (L, F and H) over a leached layer of mineral soil that, in turn, rests on a darker-colored zone of accumulation. Podzolization involves the accumulation

of organic matter on the surface, its decomposition and the movement of organic materials, along with water, through the profile. The readily soluble bases usually escape with the drainage waters, while much of the clay, iron and aluminum is deposited at a lower level. This leaching and precipitation cause the formation of layers, or horizons, parallel to the surface. It is common practice to name the major mineral horizons in alphabetical order, from the surface downward. The surface layers are referred to as the A horizon, the lower areas or layers as the zone of accumulation, or B horizon. The horizons formed usually differ in various characteristics, such as color, texture, structure and chemical composition. These horizons overlie the undeveloped C horizon.

In Shelburne County, podzolization is more pronounced in the well-drained soils. This is particularly true of the coastal areas, which receive high effective precipitation and have coarse-textured parent materials. This type of profile is represented by the Port Hebert soil series, which is described below. It is at present under a vegetation of spruce, birch, poplar and heath.

Horizon	*Depth*	*Description*
L-H	6 - 0 inches	Black, semidecomposed organic matter; felty or fibrous mor; pH 3.9.
Ae	0 - 4 inches	Gray (10 YR 5/1)[2] sandy loam; friable; pH 4.2.
Bfhcj	4 - 6 inches	Very dark brown (10 YR 2/2) sandy loam; moderately firm; slightly cemented; pH 4.4.
Bfcj	6 -18 inches	Strong brown (7.5 YR 5/6) sandy loam; firm; weakly cemented; medium subangular blocky structure; stony; pH 4.5.
C	18 + inches	Pale yellow (5 YR 7/3) sandy loam; firm; stony; pH 4.8.

Soils with imperfect drainage usually have thicker organic surface horizons than well-drained ones, mottled subsoils and shallower profiles. Soils developed under poor natural drainage are characterized by very thick organic surface layers and heavily mottled subsoils. These soils form under conditions of excessive moisture and reduced aeration over long periods. The process, called gleyzation, leads to the formation of a thick gray or olive layer beneath the organic surface.

Soils with very poor drainage, usually in depressional areas, are typified by the numerous swamp and peat bogs in the county.

Soil Survey Methods

The soil survey of Shelburne County was conducted to determine the kind, location and extent of the soils.

The soils were mapped on base maps on a scale of two inches to one mile. They were examined systematically in car and foot traverses along roads and trails. Pits were dug at regular intervals and the profiles examined. Notes were made on the vegetation, geology, crops and any other relevant information for inclusion in this report. Soil boundaries as well as the topography and stoniness were plotted directly on base maps. Aerial photographs were used extensively during the survey.

The principal soils were sampled for chemical analyses. Under forest vegetation, one sample was taken from each horizon down to and including the parent material. The results of analyses are presented at the end of this report.

System of Classification

The soils in Shelburne County were mapped as soil series. A soil series may be defined as a group of soils similar in genetic horizons and profile, except for the texture of the surface soil, and developed from a common parent

[2] Munsell color notation. Munsell Color Company, Baltimore, Maryland, U.S.A.

material. On a given parent material the differences in drainage cause different characteristics and hence give rise to different soil series. A soil series may include one or more soil types according to variations in surface texture and in properties such as slope, erosion and stoniness. In the survey of Shelburne County the separation of soil series into types was not practicable but the dominant type and variations are discussed in the text.

The soil series mapped in Shelburne County are shown in Table 3. Horizontally, the soils have developed on similar parent material and are members of the same catena; they have similar texture but differ in morphological characteristics that are associated with differences in drainage. Vertically, the soils have similar drainage but differ in texture. The Port Hebert soils are separated because they have more organic matter in the B horizon than soils in the other catenas and they intergrade to Humic Podzols.

The acreages of the various soil series in Shelburne County are given in Table 4.

TABLE 3.—A KEY TO THE SOILS OF SHELBURNE COUNTY

Parent materials		Podzolic soils		Gleysolic soils	Organic soils
		Podzols		Eluviated Gleysols	
Texture	Lithology	Well drained	Imperfectly drained	Poorly drained	
Moderately coarse-textured glacial till	Quartzite and schist	Mersey	Liverpool	Pitman	
	Quartzite and slate	Halifax	Danesville	Aspotogan	
	Granite	Gibraltar[1]	Bayswater	Aspotogan	
	Quartzite and schist or granite	Port Hebert[1]	Lydgate[2]	Roseway	
Coarse-textured outwash	Quartzite, schist and granite	Medway			Rossignol sedge peat
Organic deposits					Sphagnum peat

[1]Humic Podzol Intergrade
[2]Gleyed Humic Podzol.

TABLE 4.—ACREAGES OF SOILS IN SHELBURNE COUNTY

Soil series or land type	*Acres*	*Per cent of total area*
Mersey	106,278	16.7
Liverpool	44,339	7.0
Pitman	3,898	0.6
Halifax	80,154	12.6
Danesville	36,915	5.8
Gibraltar	67,494	10.6
Bayswater	22,074	3.5
Aspotogan	6,394	1.1
Port Hebert	16,685	2.6
Lydgate	91,347	14.4
Roseway	43,085	6.8
Medway	19,942	3.1
Sedge peat	4,384	0.7
Sphagnum peat	58,259	9.2
Swamp	717	0.1
Salt marsh	2,579	0.4
Coastal beach	1,523	0.2
Inland water	29,466	4.6
Total	635,533	100.0

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FIGURE 7.—Mersey soils, after surface stones are removed, are suitable for pasture or cultivated crops.

FIGURE 8.—Farm fields on Mersey soils are usually small because of the amount of work needed to remove stone.

Descriptions of the Soils

Soils Developed from Moderately Coarse-Textured Parent Materials

This group of soils covers over 80 per cent of Shelburne County. The soils differ enough in color, composition, consistency and degree of development to permit the separation of four catenas. All of these soils have podzol profiles. The Port Hebert, Lydgate and Roseway series have been separated because they have thicker organic surface layers than the other soils of the county under natural conditions and deeply leached Ae and cemented B horizons high in humus. The origin of the parent material may be granite, schist or quartzite.

Mersey Series (106,280 acres)

The Mersey soils occupy the largest acreage of the soils of Shelburne County. The parent material is a glacial till of sandy loam or stony sandy loam texture derived chiefly from metamorphosed slate or schist rock. The topography is gently undulating and the soils are often excessively drained and droughty because of the open, porous subsoil. Cobbles and boulders litter the surface, and generally make this soil too stony for agriculture. Some small plots have been cleared of stones and boulders and even a few farms have been established on this soil.

Pine, spruce, maple, birch and some oak grow on these soils but many areas have been burned over and now have a heath type of vegetation. The Mersey soil can support good forest growth. A typical Mersey sandy loam profile is described as follows.

Horizon	*Depth*	*Description*
L-H	3 - 0 inches	Black semidecomposed organic matter; H layer granular; pH 3.6.
Ae	0 - 1 inches	Light brownish gray (2.5 Y 6/2) sandy loam; slightly firm; infiltrated with organic matter; about 3 to 5 inches thick; pH 3.7.
Bfh	1 - 4 inches	Yellowish brown (10 YR 5/6) sandy loam; friable; 1 to 3 inches thick; pH 4.9.
Bf	4 -18 inches	Brownish yellow (10 YR 6/6) sandy loam; friable; poorly developed crumb structure; stony; about 4 to 6 inches thick; pH 5.4.
C	18 + inches	Pale yellow (5 Y 7/3) sandy loam; porous; derived chiefly from schist; pH 5.4.

Although the Mersey soil is mainly sandy loam, a few small areas may be silt loam or loam. The Mersey soil tends to have a smooth, soft consistency because of its relatively high silt content. The soil is loose and mellow and the parent material allows free drainage (Figures 7 and 8). The colors in all the profile descriptions given are for moist soils.

Utilization

The extreme stoniness of this soil in Shelburne County has prevented its development for agriculture. On the few small areas that have been cleared, good crops may be grown with the aid of lime and fertilizer. Some areas previously burned are suited to blueberry production. Forested Mersey soils should remain so, as forest production is the most efficient use for these soils at present. Spruce, hemlock, pine, birch and maple are the dominant trees.

Liverpool Series (44,340 acres)

The Liverpool series occupies the imperfectly drained positions associated with the Mersey soils. The topography is gently undulating to slightly depres-

sional. The largest areas of these soils occur north and east of Shelburne town. Their internal drainage is restricted by the topography and the shallowness to bedrock.

A profile description of the Liverpool sandy loam is as follows.

Horizon	*Depth*	*Description*
L-F-H	4 - 0 inches	Black, semidecomposed organic matter; F layer felty; H layer greasy mor; 2 to 4 inches thick; pH 3.8.
Ae	0 - 2 inches	Gray (10 YR 6/1) sandy loam; structureless; 1 to 3 inches thick; pH 4.1.
Bfh_1	2 - 6 inches	Brown (10 YR 4/3) sandy loam; friable; poorly developed medium crumb structure; stony; 4 to 6 inches thick; pH 4.7.
Bfh_2	6 -13 inches	Dark yellowish brown (10 YR 4/4) sandy loam; friable; medium crumb structure; some mottling; about 8 to 10 inches thick; pH 4.9.
Bfg	13-19 inches	Light olive brown (2.5 Y 5/4) sandy loam; strongly mottled; stony; 5 to 7 inches thick; pH 5.1.
C	19 + inches	Olive (5 Y 5/3) sandy loam; many schist fragments; pH 5.3.

The cultivated sandy loam surface soil is grayish brown. The subsoil is moderately firm and is stained with strong brown mottles.

Utilization

The Liverpool series is too stony and often too shallow for agricultural use. Where forested it supports a good growth of spruce, hemlock, maple, birch and poplar.

Pitman Series (3,900 acres)

There are no large single areas of Pitman soil in Shelburne County. It occurs in association with the Mersey and Liverpool series, usually on depressional sites. The soil is often shallow to bedrock and the water table is commonly at or near the surface. Where forested, it supports a growth of black spruce, red maple, tamarack and alder. The vegetation of the poorly drained sites is stunted black spruce and sphagnum moss. A description of a profile of Pitman sandy loam is as follows.

Horizon	*Depth*	*Description*
L-H	5 - 0 inches	Black, fairly well decomposed organic matter; H layer thick; greasy; 4 to 9 inches thick; pH 3.6.
Aeg	0 - 5 inches	Light brownish gray (10 YR 6/2) sandy loam; structureless; mottled; 4 to 8 inches thick; pH 3.6.
Bfhcg	5 - 8 inches	Dark brown (—7.5 YR 3/2) sandy loam; structureless; iron cemented; mottled; 2 to 6 inches thick; pH 4.2.
Bfg	8 -16 inches	Olive (5 Y 5/3) sandy loam; firm; mottled with strong brown (7.5 YR 5/8) stains; numerous small fragments of schist and quartzite rock materials; 6 to 10 inches thick; pH 4.6.
C	16 + inches	Light olive gray (5 Y 6/2) sandy loam; firm in place; numerous fragments of schist rock material; pH 5.0.

A fairly thick, peaty surface layer is characteristic of the Pitman series. This overlies a fairly thick, mottled Aeg and a cemented B horizon. In most cases the Pitman soil overlies firm to compact parent material; in others, the solum rests upon bedrock. The soil is mainly sandy loam.

Utilization

The Pitman soil is of no agricultural value at present and should be left in forest. On areas where the drainage is not excessively poor, it will support a fair growth of coniferous trees.

Halifax Series (80,150 acres)

The Halifax series occupies about 12 per cent of Shelburne County and occurs in association with the Danesville and Aspotogan series. Soils of this series have been mapped previously in Queens, Lunenburg, Pictou and Antigonish counties.

The Halifax soils have developed on glacial till derived chiefly from quartzite. These soils in Shelburne County are usually very stony, have a coarse sandy loam texture and are generally of little agricultural value. The topography is gently undulating, similar to that of the Mersey series, but the microrelief is more pronounced. Internal drainage is rapid.

Most of the Halifax series is forested. Barrens created by past fires cover much of the area of these soils. The vegetation on these barren areas is fern, lambkill, blueberry, wire birch and some maple. Reforestation is very slow. Forested areas support a good growth of red and white spruce, birch, maple and oak. A description of a Halifax sandy loam profile under forest vegetation is as follows.

Horizon	*Depth*	*Description*
L-H	3 - 0 inches	Dark gray semidecomposed organic matter; fibrous; 2 to 4 inches thick; pH 3.7.
Ae	0 - 2 inches	Light brownish gray (10 YR 6/2) sandy loam; structureless; friable; 1 to 3 inches thick; pH 4.0.
Bfh_1	2 -12 inches	Yellowish brown (10 YR 5/8) sandy loam; crumb structure; friable; porous; pH 4.5.
Bfh_2	12-21 inches	Brown (10 YR 5/3) sandy loam; friable; weakly developed crumb structure; porous; stony; pH 4.8.
C	21 + inches	Light olive brown (2.5 Y 5/4) sandy loam; loose; numerous angular fragments of quartzite; pH 5.2.

The surface of the Halifax series in Shelburne County is mainly sandy loam. The soils are stony both on the surface and in the profile.

Utilization

The Halifax soils have not been cleared for farming in Shelburne and should remain in forest. Excessive stoniness and low fertility limit their agricultural use.

Danesville Series (36.920 acres)

The Danesville series is imperfectly drained and occurs in association with the well-drained Halifax and poorly drained Aspotogan series.

The Danesville soils usually occur on gently undulating topography. They are very stony both on the surface and in the profile. These soils support a good growth of forest and are used only for forest production. The most common species are red maple, birch, spruce, hemlock, fir and poplar.

Horizon	*Depth*	*Description*
L-H	4 - 0 inches	Brownish black, partly decomposed organic matter; 2 to 5 inches thick; pH 3.6.
Ae	0 - 3 inches	Light brownish gray (10 YR 6/2) sandy loam; friable; 2 to 4 inches thick; pH 4.0.
Bfh	3 - 6 inches	Dark brown (7.5 YR 4/4) sandy loam; friable; medium crumb structure; 2 to 6 inches thick; pH 4.4.
Bfhg	6 -12 inches	Strong brown (7.5 YR 5/6) sandy loam; medium crumb structure; friable; mottled; some stone fragments; 4 to 8 inches thick; pH 4.8.
Bfg	12-20 inches	Yellowish brown (10 YR 5/4) sandy loam; many yellowish mottles; many stone fragments; firm; 8 to 10 inches thick; pH 5.2.
C	20 + inches	Light olive brown (2.5 Y 5/4) sandy loam; firm; numerous fragments of quartzite; pH 5.2.

Utilization

In Shelburne County no Danesville soils are being used for agricultural purposes. Excessive stoniness, poor drainage and low natural fertility limit their use.

Gibraltar Series (67,490 acres)

The Gibraltar series occupies about 11 per cent of Shelburne County and the largest area is found in the northern part. These soils occur in association with the Bayswater and Aspotogan series.

The parent material, derived chiefly from granite, is coarse sandy loam and light yellowish brown to pale yellow. The soils occur on undulating topography with low hills and ridges of shallow stony drift. Streams tend to flow slowly between areas of high land and form many stillwaters, poorly drained areas and peat bogs. The soils are shallow and are generally well to excessively drained on the higher areas. The most prominent feature of the landscape is the excessive amount of granite stones and boulders littering the surface (Figure 9). This is especially evident on the many areas that have been swept by fires and are destined to remain barren of forest for many years. These areas support a vegetation of blueberry, crowberry, sweet fern, lambkill and wire birch. Wooded areas usually are pine, spruce, hemlock, birch and maple.

A profile of Gibraltar sandy loam under forest vegetation is as follows.

Horizon	*Depth*	*Description*
L-H	4 - 0 inches	Brownish black, semidecomposed organic matter; 2 to 5 inches thick; pH 3.7.
Ae	0 - 3 inches	Pinkish gray (7.5 YR 7/2) sandy loam; structureless; loose; 1 to 4 inches thick; pH 4.0.
Bfhcj	3 - 8 inches	Strong brown (7.5 YR 5/6) sandy loam; friable; crumb structure, slightly cemented; 4 to 7 inches thick; pH 4.6.
Bfhcj	8 -16 inches	Yellowish brown (10 YR 5/6) sandy loam; weakly developed crumb structure; friable; 6 to 12 inches thick; pH 4.8.
Bf	16-23 inches	Light yellowish brown (10 YR 6/4) sandy loam; structureless; stone fragments; 5 to 10 inches thick; pH 5.0.
C	23 + inches	Pale yellow (5 Y 7/3) sandy loam; porous; gritty and coarse-textured; very stony; pH 5.0.

Gibraltar soils tend to be droughty, particularly where the vegetative cover is thin or absent or where the protective organic mat has been destroyed. The B horizon may occasionally be cemented, but this is more evident in coastal areas, where many areas of the granitic parent materials have been mapped as the Port Hebert series.

Utilization

In Shelburne County there are almost no Gibraltar soils suitable for agriculture. The soils are capable of supporting good tree growth and an active program of fire prevention, controlled cutting and reforestation is needed for their efficient use.

Bayswater Series (22,070 acres)

The Bayswater series occupies about 4 per cent of Shelburne County and occurs in association with the Gibraltar and Aspotogan soils. The topography of the Bayswater soils is gently undulating to level. The drainage is restricted by the topography or by bedrock. The soils are too stony to be used for agriculture. Forest vegetation includes hemlock, red maple, black spruce, red spruce, wire birch and alder.

A Bayswater sandy loam profile is described as follows.

Horizon	*Depth*	*Description*
L-H	4 - 0 inches	Brown, semidecomposed moss and leaf litter; H layer thin, well decomposed; 3 to 6 inches thick; pH 3.6.
Ae	0 - 3 inches	Light gray (10 YR 7/1) sandy loam; structureless; loose; 1 to 4 inches thick; pH 3.8.
Bfhg	3 -12 inches	Brown (10 YR 5/3) sandy loam; coarse, gritty feel; weakly developed crumb structure; friable; some mottling; stone fragments; 8 to 10 inches thick; pH 4.5.
Bfg	12-24 inches	Yellowish brown (10 YR 5/6) sandy loam; porous; friable; weak crumb structure; strongly mottled; about 13 inches thick; pH 4.8.
C	24 + inches	Very pale brown (10 YR 7/3) sandy loam; granite fragments; porous; stony; pH 5.0.

A weakly cemented layer is often present in the B horizon. This is more pronounced in coastal areas.

FIGURE 9.—Stones and boulders are prominent on Gibraltar soils. Many areas in Shelburne County have been swept by fires.

Utilization

The Bayswater soil should remain in forest. It is too stony for agriculture.

ASPOTOGAN SERIES (6,390 acres)

This is a poorly drained soil on depressional to level topography in association with the Halifax, Gibraltar, Danesville and Bayswater series. Soils of the Aspotogan series have thick organic surface layers and strongly mottled subsoils. Drainage is restricted by the topography and shallowness over bedrock. The vegetation is red maple, black spruce, hemlock, tamarack and alder.

A description of a profile of Aspotogan sandy loam under forest vegetation of maple, fir and birch is as follows.

Horizon	*Depth*	*Description*
L-H	6 - 0 inches	Very dark gray, partly decomposed organic matter; H layer black, greasy; pH 3.5.
Aeg	0 - 3 inches	Light olive gray (5 Y 6/2) sandy loam; structureless; mottled; pH 3.8.
Bfg_1	3 - 7 inches	Grayish brown (10 YR 5/2) sandy loam; weakly developed subangular blocky structure; many dark brown mottles; some stone; pH 4.5.
Bfg_2	7 -14 inches	Yellowish brown (10 YR 5/4) sandy loam; slightly firm; strongly mottled; structureless; pH 4.8.
C	14 + inches	Light yellowish brown (2.5 Y 6/4) stony sandy loam; slightly firm but porous; numerous fragments of quartzite and granite; pH 5.0.

The Bg horizon is frequently cemented in this soil.

Utilization

Aspotogan soils are unsuitable for agriculture. Their excessive stoniness, poor drainage and shallowness often make them unsuitable for forest except stunted black spruce and tamarack trees.

Port Hebert Series (16,680 acres)

This series is found along the coast of Shelburne County in association with the Lydgate and Roseway series. The soils occupy about 3 per cent of the county. They are moderately well drained and occur on undulating topography. The parent material is coarse-textured and is derived from granite, quartzite or schist. The Port Hebert soils have thick organic surface layers, deep leached layers and cemented dark-colored B horizons, fairly high in organic matter. This soil shows many characteristics of the Humic Podzol great soil group.

Vegetation is birch, poplar, spruce, maple and heath. A profile of Port Hebert sandy loam is described as follows.

Horizon	*Depth*	*Description*
L-H-F	6 - 0 inches	Black, semidecomposed organic matter; F layer fibrous; H layer thick, greasy, 4 to 10 inches thick; pH 3.8.
Ae	0 - 4 inches	Grayish brown (10 YR 5/2) sandy loam; impregnated with organic matter in the top inch; friable; porous; 3 to 8 inches thick; pH 4.0.
Bfhcj	4 - 8 inches	Dark brown (7.5 YR 4/2) sandy loam; firm; weakly cemented; 3 to 6 inches thick; pH 4.6.
Bfcj	8 -16 inches	Strong brown (7.5 YR 5/6) sandy loam; firm; cemented; 6 to 10 inches thick; pH 4.8.
C	16 + inches	Light yellowish brown (2.5 Y 6/4) sandy loam; firm; numerous stone fragments; pH 5.0.

The cultivated layer is very dark brown to grayish brown sandy loam. Generally it has a well-developed crumb structure.

Utilization

The Port Hebert soils are unsuitable for agriculture because of the large amount of stone and boulders on the surface and in the soil. However, small areas near the many small fishing communities along the coast have been cleared and are cultivated. The soils are well suited for blueberry production and large areas of fire barren south of Shelburne town and east of Pubnico have been partially developed for this crop. There is room for improvement in the production, quality and marketing of blueberries. For the most part Port Hebert soils are best suited for forest.

Lydgate Series (91,350 acres)

The Lydgate series occupies about 14 per cent of the total area of Shelburne County. It occurs on moderately undulating topography in association with the Port Hebert and Roseway series. Surface drainage is usually fairly rapid, but the high organic matter content of the surface layer retains moisture over long periods. Internal drainage is also restricted by the strong cementing in the B horizon. The Lydgate soils are very stony and unsuited to agriculture. Where forested, tree growth is spruce, white birch, maple and poplar. Large areas are covered with heath vegetation of blueberry, lambkill, crowberry, Labrador tea and spiraea. A description of a Lydgate profile developed under heath vegetation is as follows.

Horizon	*Depth*	*Description*
L-F-H	4 - 0 inches	Dark brown, semidecomposed organic matter; F layer thick, fibrous; H layer black greasy mor; 5 to 10 inches thick; pH 3.3.
Ae	0 - 8 inches	Light brownish gray (2.5 Y 6/2) sandy loam; infiltrated with organic matter in the upper 2 inches; structureless; friable; 3 to 10 inches thick; pH 3.9.
Bhg	8 -12 inches	Dark reddish brown (5 YR 3/2) sandy loam; slightly cemented; mottled; crumb structure; 2 to 6 inches thick; pH 4.4.
Bfcg	12-17 inches	Strong brown (7.5 YR 5/6) sandy loam; strongly cemented; strongly mottled; 5 to 9 inches thick; pH 5.0.
C	17 + inches	Pale yellow (5 Y 7/3) sandy loam; firm; many quartzite and schist cobbles; pH 5.0.

The Lydgate soils are Gleyed Humic Podzols. An ortstein layer usually occurs in the lower B horizon. The Lydgate soils developed from granitic parent material are usually stonier than those developed from schist or quartzite. The thick organic surface has a high moisture-holding capacity and keeps the soil saturated with water for long periods. Cultivation improves the drainage.

Utilization

The Lydgate soils are too stony for agriculture and should remain in forest. A few small areas have been cleared of stone and are used for gardens and pasture. These small farms rarely have more than two or three head of livestock.

Roseway Series (43,080 acres)

The Roseway series occurs in association with the Lydgate series on gently undulating to depressional topography. The surface of these soils is very peaty. Forest vegetation is of poor quality and limited to stunted black spruce, alder and tamarack. In numerous areas drainage is so poor that forest vegetation will not grow. In these areas sphagnum moss and sedges are the principal vegetation.

A profile description of Roseway sandy loam is as follows.

Horizon	*Depth*	*Description*
L-H	8 - 0 inches	Black, partly decomposed organic matter; F layer thick, fibrous; H layer thick greasy mor; 8 to 12 inches thick; pH 3.8.
Aeg	0 - 8 inches	Dark gray (10 YR 4/1) sandy loam; structureless; mottled with brownish gray patches and streaks; impregnated with organic matter; 4 to 10 inches thick; pH 4.0.
Bfg	8 -16 inches	Dark grayish brown (10 YR 4/2) sandy loam; structureless; strongly gleyed; strongly mottled with yellowish brown streaks; 6 to 12 inches thick; pH 4.8.
Cg	16 + inches	Grayish brown (2.5 Y 5/2) sandy loam; firm; mottled; very stony; pH 5.0.

The Roseway soils are strongly mottled throughout the profile. Cementation often occurs in the B horizon, but more often it is a firm gleylike horizon. Organic matter is usually abundant in the A and upper B horizons. The diffusion of organic matter through the upper solum characterizes the soils of the Port Hebert, Lydgate and Roseway series.

Utilization

The Roseway soil is unsuitable for agriculture and much of the area is poorly suited for forest.

Soils Developed from Gravelly Sandy Loam Stratified Parent Materials

Stratified parent materials have been moved and deposited by glaciofluvial action in various parts of Shelburne County. Most of the deposits are kames, eskers, outwash plains and river terraces. Since all these deposits are coarse-textured and of similar composition they have been mapped as soils of the Medway series. Most of the material is well-drained, so that only one series was separated. Some small areas of the imperfectly and poorly drained soils were included with the well-drained areas.

Medway Series (19,940 acres)

The Medway soils occupy about 3 per cent of Shelburne County. They have developed on kames, eskers, outwash plains and river terraces (Figure 10). The soil parent material is stratified and made up chiefly of quartzite with some schist and granite. It is a grayish brown, gravelly sandy loam and is often stony. Almost all of the areas are well to excessively drained. The amount of surface stone varies; some areas are almost stone-free and others too stony for agriculture. Near the coast the Medway soils have a high organic matter content in their surface layers and a better moisture-holding capacity.

The larger areas of Medway soils occur along the Clyde and Roseway rivers at Baccaro Point, Port la Tour and Upper Ohio in the northern part of the county. The deposits are often shallow over bedrock or till. At times they form an intricate pattern with the till and could not be separated on the mapping scale used. When forested, the Medway soils support a good growth of pine, spruce, hemlock, birch and maple.

A description of a typical Medway sandy loam profile is as follows.

Horizon	*Depth*	*Description*
L-H	2 - 0 inches	Brown semidecomposed organic matter; fibrous; H layer thin; pH 3.3.
Ae	0 - 2 inches	Light brownish gray (10 YR 6/2) sandy loam; structureless; friable; 1 to 4 inches thick; pH 3.9.
Bfh	2 -12 inches	Yellowish brown (10 YR 5/6) sandy loam; loose, porous; single grain; 6 to 12 inches thick; pH 5.5.
Bf	12-22 inches	Brownish yellow (10 YR 6/6) sandy loam; friable; porous; 6 to 10 inches thick; pH 5.5.
C	22 + inches	Pale yellow (2.5 Y 7/4) gravelly sandy loam; porous; pH 5.5.

Where cultivated, the surface layer is very dark gray (7.5 YR 3/0) and has a well-developed crumb structure if the organic matter is fairly high. It is porous and tends to be droughty.

Utilization

A larger percentage of the Medway soils is used for agriculture than of any other in Shelburne County. There are many small areas cleared of stone where vegetable crops, some roots, hay, grains and pasture crops are grown. The soils are fairly well suited for growing vegetables and small fruits such

as strawberries. Fair to good crops of hay and grain can be obtained with adequate use of lime and fertilizers. The areas farmed are usually near the coast, where there is a relatively high content of organic matter and therefore a better moisture-holding capacity. Most of the farmed areas are not excessively stony. Other areas, particularly around Clyde River, are too stony to be suitable for agriculture. Where better soils are available, the Medway soils should be left in forest.

FIGURE 10.—Where Medway soils are stony they are unsuitable for agriculture.

Soils Developed from Organic Materials

These soils occupy 62,540 acres, or about 10 per cent, of Shelburne County. They have been divided into two classes depending on the type of vegetation from which they were formed. Sedge peat is decomposed sedge mixed with lake sediments. Sphagnum peat is chiefly sphagnum moss.

ROSSIGNOL SEDGE PEAT (4,380 acres)

This soil is in small areas along sluggish streams and the vegetation is mostly sedges and coarse swamp grasses. The surface 8 to 10 inches is poorly decomposed, very dark gray organic material. Underlying this surface layer there is 1 to 5 feet of poorly decomposed sedges and mineral sediments. These organic deposits are wet during most of the year.

Utilization

Most of the areas are too wet to be used for agriculture. A few of them are harvested for hay.

SPHAGNUM PEAT (58,260 acres)

This group of organic deposits occupies slightly over 9 per cent of the total area of Shelburne County. The deposits are on level to depressional

topography, usually on old lake beds that have filled in with organic material. The deposits are mostly poorly decomposed organic matter from sphagnum moss and sedges, and are very acid and saturated with water. There is no forest vegetation except stunted black spruce, fir and tamarack trees, which often die after a few years (Figure 11).

FIGURE 11.—There are large areas of peat in Shelburne County.

Utilization

No peat bogs in Shelburne County are being used. Many of the deposits are deep and have a possible use as commercial peat moss and peat fuel. Some areas of peat may be suitable for drainage and cultivation. The Port Clyde and Clyde River deposits are the largest single areas in the county.

Miscellaneous Soils

These include swamp, salt marsh and coastal beach and occupy less than 1 per cent of Shelburne County.

SWAMP (720 acres)

This soil is formed under conditions of extremely poor drainage; there is a water table at or near the surface most of the year. The surface 5 to 12 inches is highly organic; it is very dark gray to black and overlies gray to dark gray mineral soil. The subsoil is usually compacted and heavily mottled. The soil belongs to the Eluviated Gleysols. The vegetation is black spruce, tamarack, alder, sedges and sphagnum moss.

Utilization

This soil is unsuitable for agriculture.

Salt Marsh (2,580 acres)

The salt marshes are marine sediments, deposited from tidal water flooding low-lying coastal areas. The deposits occur in protected bays and other inlets and near the mouths of streams. The deposits vary in depth and are gray to olive, uniform silt loam. They are very often flooded and are covered by salt-tolerant vegetation, chiefly marsh grass, sea-blite, glasswort and spurry.

Utilization

At present some of the salt marsh grass is harvested for hay and used as poor-quality feed or for bedding livestock. Otherwise, these marsh grasses are of no agricultural value.

Coastal Beach (1,520 acres)

These deposits are wave-washed sand or gravel in beaches or bars that protect inlets. They do not form profiles since they are continually being removed and re-deposited.

There are good beaches in the county, and summer homes, cottages and tourist accommodations are on many of the better ones.

AGRICULTURE AND LAND USE

Present Land Use

A very large part of Shelburne County is forested or rough land. Farms occupy only 1.5 per cent of the area and only 10 per cent of the farm area has been classified as improved land. The number of farms in the county was given as 85 in the 1956 census. Of these 50 per cent were under 70 acres and 4 were over 750 acres, but the area of improved land per farm is small (Table 5). About 99 per cent of Shelburne County is unsuitable for agriculture.

TABLE 5.—ACRES OF FARM LAND IN VARIOUS USES IN SHELBURNE COUNTY, 1956

Total land area	626,560
Area of farms	9,562
Number of farms	85
Improved land	948
Field crops	435
Pasture	388
Orchard	3
Other	122
Unimproved land	8,164
Woodland	7,128
Other	1,486

Table 6 shows the acreages of various field crops in the county in 1956.

TABLE 6.—ACRES OF FIELD CROPS IN SHELBURNE COUNTY, 1956

All field crops	435
Hay	383
Oats for hay	13
Potatoes	23
Turnips, swedes and mangels	10
Other	6

Dairy and mixed farming are the most important agricultural industries in the county. Most of the products are used locally. About 50 per cent of the milk produced is sold as fluid milk and the rest as cream, butter or butterfat. Table 7 shows the numbers and kinds of livestock found in the area in 1956.

TABLE 7.—TYPES AND NUMBERS OF LIVESTOCK AND POULTRY IN SHELBURNE COUNTY, 1956

Horses	28
Cattle, total	574
Dairy cattle (2 years and over)	263
Beef cattle (2 years and over)	32
Steers (1 year and over)	81
Other cattle	198
Swine	94
Sheep	270
Hens and chickens	17,201
Turkeys	1,104
Ducks	49
Geese	24

Shelburne County has the lowest ratio of area of improved land to number of cattle of all counties in the province. Practically all farms are owner-operated, are free of mortgages and have electricity. In poultry farming, land unsuitable for crops is used and an increase in this type of farming should be encouraged. The average farm income is low and must be supplemented by other means such as fishing or lumbering. Lumbering is an important industry in the county and most of the land is more suitable for forestry than agriculture.

Table 8 indicates the areas of land in various classes in the county.

TABLE 8.—AREAS OF LAND IN VARIOUS CLASSES IN SHELBURNE COUNTY, 1958[1]

Land class	Acres		Per cent
Forested land			
Coniferous forest	242,000		37.9
Mixed forest	119,000		18.7
Deciduous forest	4,000		0.6
Total productive forest	365,000		57.2
Depleted forest	5,000		0.8
Total		370,000	58.0
Nonforested and nonproductive land			
Brush land, rock barren, and burn not being restocked		126,000	19.7
Waste land			
Tidal mud flats, marsh, muskeg with stunted trees, sand and gravel pits, cape and quarry		96,000	15.0
Agriculture and other improved land		15,000	2.3
Water			
Lakes, rivers and estuaries		32,000	5.0
Total area		639,000	100.0

[1]Hawboldt, L. S., and R. M. Bulmer, The forest resources of Nova Scotia. N.S. Dept. Lands and Forests, P. 124. 1958.

Land Use Capability

Most of the soils of Shelburne County are too stony for cultivation and should be left in forest. Poor drainage, shallowness, droughtiness and infertility limit the use of other soils for agriculture. All the soils of the area were grouped

according to the characteristics that make them suitable for use (Figure 12). In the seven classes of the classification scheme, physical factors impose increasingly severe limitations on the use of land for crops. The classes may be subdivided into subclasses.

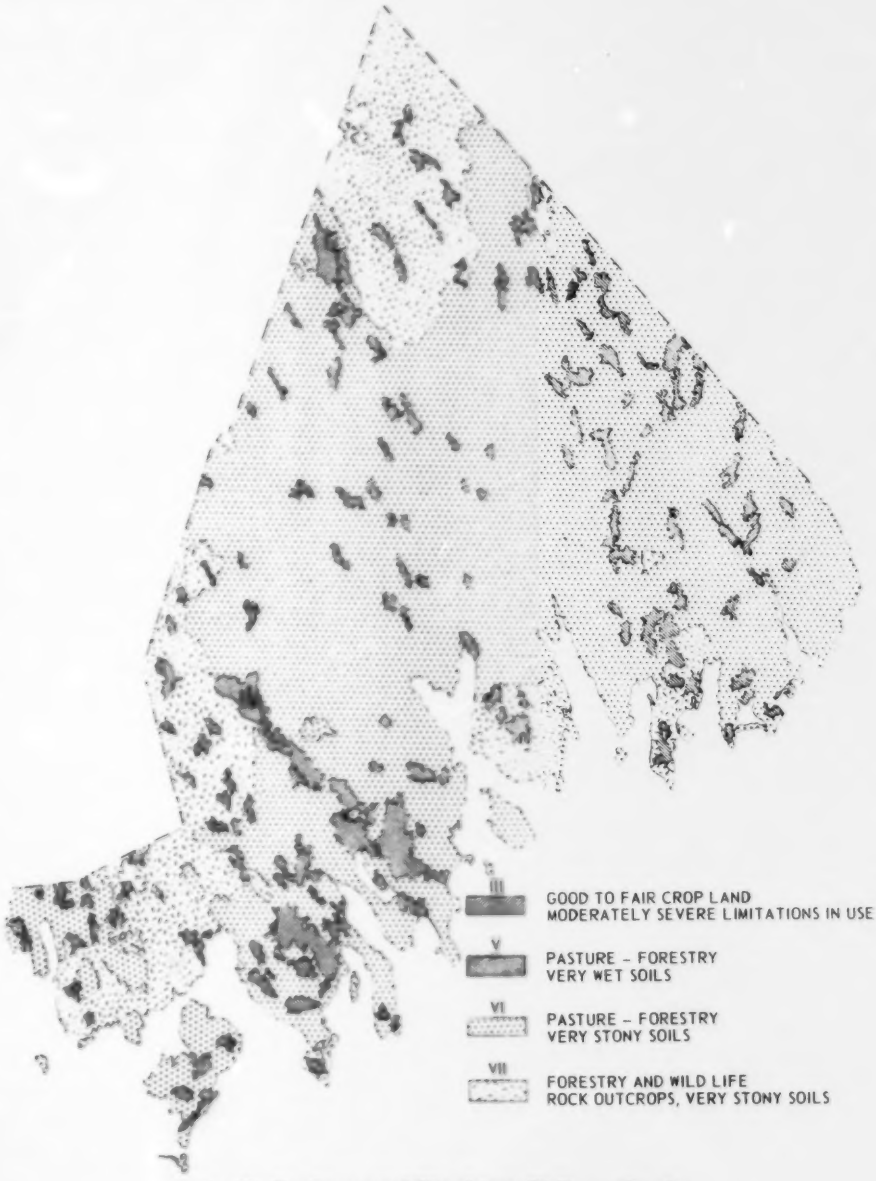

FIGURE 12.—Land use capability classes, Shelburne County.

Soils in Classes I to IV are suitable for cultivated crops, pasture or woodland, but the alternative uses become fewer and the risks greater from Class I to Class IV. Soils in Classes V to VII are best suited for pasture or forest.

The subclass defines the kinds of limitations for agricultural use, under the headings: stoniness, shallowness, wetness, slope and erosion hazards.

Texture, structure, susceptibility to erosion, natural fertility, ease of cultivation, water-holding capacity and stoniness—any of these factors or a combination may limit the use of a soil. The soils that belong in each subclass are listed with their topographic and stoniness symbols as these appear on the soil map. The symbols for topography are:

A Level or nearly level, 0-3 per cent slope.
B Undulating, 3-8 per cent slope.
C Rolling, 8-16 per cent slope.
D Strongly rolling to hilly, 16-30 per cent slope.

The symbols for stoniness are:

0 Stone-free.
1 Slightly stony; no hindrance to cultivation.
2 Moderately stony; enough stone to interfere with cultivation unless removed.
3 Very stony; sufficient stone to be a severe handicap to cultivation.
4 Excessively stony; nonarable, too stony for cultivation.

Class I

Land in Class I is easy to work and can be cultivated safely by ordinary good farming methods. The soils are deep, fertile and productive. The land is nearly level and there is little or no erosion. The minimum frost-free period is 100 days.

Class II

Land of this class is nearly level to gently sloping with moderate susceptibility to erosion. The soils are moderately deep and have favorable texture; an occasional moderate overflow or wetness can be corrected. They can be cultivated profitably with the aid of terracing, protective cover crops, and simple water management operations.

No significant area of land in Shelburne County is good enough to be placed in Class I or II.

Class III

Land in this class has moderately severe limitations to its use in agriculture. Erosion hazards range from light to moderate. The only soil series in this class in Shelburne County is Medway. The use of this soil is limited by low moisture-holding capacity, low fertility and stoniness (Table 9). The soils in Class III occupy about 2 per cent of the land area.

TABLE 9.—SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF SHELBURNE COUNTY IN LAND USE CAPABILITY CLASS III, THOSE WITH MODERATELY SEVERE LIMITATIONS

Land use capability	Subclass		Soil series, topography and stoniness	Acres
	Limitations	Texture		
Level to moderately steeply sloping land, susceptible to moderate erosion. Soil may have slow permeability, moderate overflow hazard, excessive wetness, shallowness, low moisture-holding capacity and low fertility. Choice of crops may be restricted.	Low moisture-holding capacity, shallowness, inherent stoniness	Coarse-textured	Medway B-2	9,510
Total area (Class III)				9,510

Class IV

The choice of crops that may be grown on soils of this class is severely limited by slope, wetness or droughtiness and most of the land is best suited for pasture or forest.

Only very small areas of the Port Hebert, Gibraltar and Lydgate series fall in this group (Table 10). The areas are too small to be shown on the map in Figure 12 and occupy about 0.2 per cent of the land area.

TABLE 10.—SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF SHELBURNE COUNTY IN LAND USE CAPABILITY CLASS IV, THOSE WITH SEVERE LIMITATIONS

Land use capability	Subclass		Soil series, topography and stoniness		Acres
	Limitations	Texture			
Steep slopes, severe erosion, inherent stoniness, imperfect drainage. Choice of crops may be limited. The number of years favorable for cultivation may be limited (1 out of 6). Best suited for pasture or hay.	Erosion hazard, inherent stoniness, tillage problems, steep slopes	Moderately coarse-textured	Port Hebert	B-2	181
				C-2	72
			Gibraltar	C-2	333
					606
	Imperfect drainage, shallowness, inherent stoniness		Lydgate	C-2	496
					496
Total area (Class IV).....					1,102

Class V

This land class, which occupies 11 per cent of the county, is not suitable for cultivation. It includes land permanently wet or frequently overflowed (Table 11). Drainage is difficult and costly. It is possible that some of the areas of sphagnum peat may be cultivated in future. However, special techniques are necessary. At present almost no peat areas are being cultivated in the province.

TABLE 11.—SERIES, DESCRIPTIONS AND ACREAGES OF SOILS IN SHELBURNE COUNTY IN LAND USE CAPABILITY CLASS V, THOSE NOT SUITABLE FOR CULTIVATION

Land use capability	Subclass		Soil series, topography and stoniness		Acres
	Limitations	Texture			
Not suitable for cultivation. Nearly level land with permanent wetness, stoniness, and overflow limiting cultivation of crops. Grazing or forestry is the best use.	Limited by excessive wetness and inherent stoniness	Medium-textured to moderately coarse-textured	Roseway	B-2	314
					314
		Moderately fine-textured	Salt marsh		2,579
					2,579
		Organic soils	Sedge peat		4,384
			Sphagnum peat		58,259
			Swamp		717
					63,363
Total area (Class V).....					66,253

Class VI

This land is too steep, stony, droughty, shallow or wet for cultivation (Table 12). Most areas are suitable only for forestry but occasionally small clearings may be used as rough pasture. This soil class occupies about 64 per cent of the land area of Shelburne County.

TABLE 12.—SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF SHELBURNE COUNTY IN LAND USE CAPABILITY CLASS VI, THOSE SUITABLE FOR GRAZING OR FORESTRY

Land use capability	Subclass		Soil series, topography and stoniness		Acres
	Limitations	Texture			
Steep, stony, eroded, shallow, wet and droughty land. Suitable for grazing or forestry with moderate limitations.	Limited by stoniness, rock outcrops, shallowness	Moderately coarse-textured	Mersey	B-3	85,075
				C-3	21,112
			Port Hebert	C-3	11,093
			Halifax	C-3	78,490
				D-3	589
			Gibraltar	C-3	13,072
					209,431
	Imperfectly drained stony		Liverpool	B-3	44,339
			Lydgate	B-3	47,897
				C-3	1,787
			Danesville	B-3	35,518
			Bayswater	B-3	3,282
					132,823
	Poorly drained, stony		Pitman	A-3	1,709
				B-3	2,189
			Roseway	A-3	56
				B-3	42,264
			Aspotogan	A-3	949
				B-3	4,210
					51,377
	Droughty, stony	Coarse-textured	Medway	B-3	160
				C-3	10,272
			Coastal beach		1,523
					11,955
Total area (Class VI)					405,586

Soil Ratings

In Shelburne County, stoniness, drainage, texture, relief and natural fertility are factors that govern the suitability of the soils for crop production. Areas classed as good to fair crop land may have within their boundaries smaller areas generally unsuited for agriculture. A soil rated as poor or unsuitable for most crops may be well suited for specialized production. This is true of areas used for blueberry production; about 100 acres are regularly burned and sprayed. Much of it is very stony and may fall in land use capability Class VI or VII. Also, small areas of soils of Classes VI and VII have been cleared and are farmed to a limited extent.

CLASS VII

The land in this class is suitable for forest. It includes very steep, stony and very wet land and occupies about 20 per cent of the surveyed area (Table 13).

TABLE 13.—SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF SHELBURNE COUNTY IN LAND USE CAPABILITY CLASS VII, THOSE SUITABLE FOR FORESTRY AND WILDLIFE

Land use capability	Subclass		Soil series, topography and stoniness		Acres
	Limitations	Texture			
Very stony, steep, rocky, shallow, droughty and swampy land. Chiefly useful for forestry and wildlife. Limited areas suitable for grazing.	Very stony	Moderately coarse-textured	Mersey	C-4	91
			Port Hebert	C-4	5,339
			Halifax	C-4	1,075
			Gibraltar	B-4	45,758
				C-4	8,311
					60,574
	Imperfectly drained, very stony		Lydgate	B-4	23,531
				C-4	17,636
			Danesville	B-4	1,397
			Bayswater	B-4	18,792
					61,356
	Excessively wet, very stony		Roseway	A-4	224
				B-4	227
			Aspotogan	A-4	408
				B-4	827
					1,686
Total area (Class VII)					123,616

The soils of land use capability Classes III and IV have been rated on their suitability for production of the principal crops grown in the area (Table 14).

TABLE 14.—SUITABILITY[1] FOR PRODUCTION OF SELECTED CROPS OF SOILS IN LAND CLASSES III AND IV[2]

Soil series	Acres	Hay	Grain	Pasture	Potatoes	Vegetables
Class III. Good to fair crop land—						
Medway	9,510	F	F	F-P	F-G	F
Class IV. Fair to poor crop land						
Port Hebert	250	P	P	F	P	P
Gibraltar	350	P	P	F	P	P
Lydgate	500	F-P	F-P	F-G	P	P

[1]G, good; F, fair; P, poor.
[2]Classes V to VII are unsuitable for agriculture.

DISCUSSION OF ANALYTICAL DATA

The results of physical and chemical analyses of the soils found in the area are given in Tables 15 and 16. The samples analyzed were taken from soil profiles under forested conditions and do not include any cultivated surface layers.

Carbon and Nitrogen

The determination of carbon content indicates how much organic matter is present in a soil sample. The carbon determination was made by dry combustion with measurement of carbon dioxide evolved. The soils of the area generally have more organic matter than the average soils of the province. This is particularly true of the soils of the Port Hebert catena. Cultivated soils in the area, to be of value, require a high content of organic matter because of their coarse texture.

Organic matter increases the water-holding capacity and hence conserves soil moisture in dry seasons. It also improves structure, adds nutrients and provides a medium for important biological activity.

Nitrogen is usually found in soils in direct proportion to organic matter content. The nitrogen level is usually adequate if the organic matter content is high enough. During the growing season, microbiological activity releases nitrogen from soil organic matter and makes it available to plants. In the early spring, nitrogen fertilizers should be applied to give crops a start, because at this time biological activity in the soils is low and the rate of formation of available nitrogen is not adequate to meet crop needs. The growing of leguminous crops will add nitrogen to the soil by fixation of atmospheric nitrogen.

pH and Lime Requirement

In general, the soils of the area are very acid and require lime for crop production. Cultivated soils require about 2 to 3 tons per acre during a rotation, until the soil reaches about pH 6.3. Smaller applications will then maintain this pH value.

Silica, Sesquioxides, Total and Free Iron

Sesquioxides were determined by precipitation with aluminum hydroxide. Total iron was determined by titration with potassium dichromate and free iron was determined by a modification of Deb's[3] method.

The ratio of silica to sesquioxides in the various horizons of profiles examined ranges from about 10 to 1 in the Ae to 4.5 to 1 in the B and C horizons. Movement of iron and aluminum from the Ae into lower horizons is indicated.

Calcium, Potassium, Magnesium and Phosphorus

The soils of the area are coarse-textured and strongly leached. Consequently, the available calcium, potassium and magnesium are low as are also the total and available phosphorus (Table 16). Commercial fertilizers, lime and organic matter are needed to build up the fertility of areas used for crop production.

Cobalt

A number of soil areas of the province are deficient in cobalt. A deficiency of this element in forage crops shows up as wasting disease in cattle. This condition is usually treated by adding the correct concentration of a cobaltized salt to the feed ration. Research work done by the Nova Scotia Research Foundation and the occurrences of wasting disease in cattle suggest a cobalt deficiency in many of the soils of Shelburne County.

The physical analyses shown (Table 15) were determined by the Bouyoucos hydrometer method. Chemical methods are from A. O. A. C. Methods of Analysis.

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[3] Deb, B.C. The estimation of free iron oxides in soils and clays and their removal. Soil Sci. 1: 212-220. 1950.

TABLE 15.—CHEMICAL AND PHYSICAL ANALYSES OF THREE REPRESENTATIVE SOIL PROFILES OF SHELBURNE COUNTY

Horizon	Depth inches	Chemical Analyses: Carbon %	pH	Total N %	Total P_2O_5 %	Total SiO_2 %	Total R_2O_3 %	Total Fe_2O_3 %	Free Fe_2O_3 %	Total CaO %	Total MgO %	Milliequivalents per 100 grams of soil: Exchange capacity	Ca	Mg	K	Physical Analyses: Gravel	Sand 2 .05 mm. %	Silt .05-.002 mm. %	Clay below .002 mm. %
Medway Loamy Sand																			
L-H	2-0	52.38	3.3	1.24	0.23	4.13	0.31	0.72	—	0.22	0.54	125.7	1.20	2.62	1.03	—	—	—	—
Ae	0-2	1.07	3.9	0.05	0.03	86.98	8.26	1.12	0.15	0.77	0.09	3.8	0.14	0.28	0.04	0.7	79.0	19.5	1.5
Bfh	2-12	1.68	5.5	0.08	0.08	72.79	17.86	3.32	1.15	1.09	0.34	5.5	0.04	0.11	0.04	35.2	82.0	17.8	0.2
Bf	12-22	0.21	5.5	0.03	0.16	79.14	15.20	2.68	0.44	1.42	0.66	3.2	0.03	0.22	0.04	36.2	88.2	11.3	0.5
C	22+	0.13	5.5	0.02	0.17	81.14	13.78	2.44	0.31	1.29	0.42	1.9	0.04	0.11	0.03	5.9	85.0	13.6	1.4
Lydgate Sandy Loam																			
L-F-H	4-0	48.19	3.5	1.20	0.24	9.97	2.86	0.48	—	0.33	0.23	132.6	3.54	5.34	1.64	—	—	—	—
Ae	0-8	0.67	3.9	0.05	0.02	84.69	11.14	1.44	0.09	0.59	0.21	2.8	0.11	0.14	0.03	4.0	55.2	43.0	1.8
Bh	8-12	5.82	4.4	0.20	0.08	69.82	14.17	2.16	0.39	0.92	0.44	22.4	0.18	0.33	0.08	5.7	55.2	43.2	1.6
Bfc	12-17	1.19	5.0	0.04	0.08	79.08	14.38	3.28	0.89	1.00	0.47	5.0	0.08	0.16	0.03	33.2	64.2	34.2	1.6
Mersey Sandy Loam																			
L-H	3-0	50.04	3.6	1.25	0.14	7.20	0.67	—	—	0.62	0.28	120.1	10.87	6.20	1.21	—	—	—	—
Aecj	0-1	1.27	3.7	0.04	0.02	89.28	7.15	1.40	0.34	0.41	0.13	5.1	0.14	0.78	0.11	8.9	55.2	42.0	2.8
Bfhcj	1-4	2.14	4.9	0.09	0.04	73.22	16.65	3.60	1.60	0.62	0.26	10.0	0.06	0.28	0.08	24.6	50.9	38.2	1.9
Bf	4-18	0.98	5.4	0.05	0.05	74.42	17.39	3.68	1.08	0.94	0.67	6.0	0.14	0.11	0.03	50.5	61.4	38.2	0.4
C	18+	0.31	5.4	0.02	0.06	76.12	16.63	3.76	0.34	1.06	0.76	2.4	0.06	0.17	0.05	64.3	60.4	39.4	0.2

TABLE 16.—AVAILABLE NUTRIENTS, POUNDS PER ACRE,[1] IN THREE REPRESENTATIVE SOIL PROFILES OF SHELBURNE COUNTY

Series	Horizon	Depth, Inches	Ca	Mg	K	P
Medway	L-H	2-0	46	60	77	5
	Ae	0-2	56	67	31	10
	Bfh	2-12	16	26	31	16
	Bf	12-22	12	52	31	18
	C	22+	16	26	23	12
Lydgate	L-F-H	4-0	136	123	123	3
	Ae	0-8	44	33	23	2
	Bh	8-12	72	79	62	1
	Bfc	12-17	32	38	23	4
Mersey	L-H	3-0	419	143	91	5
	Ae	0-1	56	187	85	8
	Bfhcj	1-4	24	67	62	10
	Bf	4-18	56	26	23	14
	C	18+	24	40	39	24

[1]Available nutrients calculated on the basis of 2,000,000 pounds of soil per acre, to six inches deep, except the L-H horizons which are calculated on the basis of 193,000 pounds per acre.

SUMMARY

Shelburne County, in the southwestern part of Nova Scotia, has an area of 993 square miles, or 635,532 acres. About 15 per cent of this is made up of peat deposits, lakes, and rivers. About 0.1 per cent of the county is classed as improved land.

Shelburne County is a broad undulating plain that forms part of the southern upland of the province. The surface rises gently from the coast to about 500 feet above mean sea level at the northern boundary of the county. The bedrock is chiefly metamorphosed Precambrian or igneous rock of Devonian age. The drift over the whole county is shallow and the soils are excessively stony.

The climate is humid temperate. The coastal areas have an annual precipitation of 60 inches, but inland the average is lower. The mean annual temperature is 44° F.

The county has a population of 14,604. Fishing is the chief industry and most of the people live near the coast.

The well-drained soils belong to the Podzol great soil group. They have an ashy-gray layer beneath a very acid surface organic mat. Beneath this there is a brown to yellowish brown horizon that rests on olive to olive yellow parent material at about 18 to 28 inches deep. The soils are acid throughout and when cultivated require lime, fertilizer and organic matter. Few areas are suitable for agriculture and no new areas of soil should be broken for they are more suited for forest.

GLOSSARY

Organic Horizons

L—An organic layer characterized by an accumulation of organic matter in which the original structures are discernible.

F—An organic layer characterized by an accumulation of partly decomposed organic matter in which the original structures are discernible with difficulty. Fungi mycelia are often present.

H—An organic layer characterized by an accumulation of decomposed organic matter in which the original structures are not discernible.

NOTE 1—Where it was not possible or advisable to subdivide the organic layer it was referred to as the L-H horizon.

Master Mineral Horizons

A—A mineral horizon or horizon formed at or near the surface in the zone of maximum removal of materials in solution and suspension with or without maximum in situ accumulation of organic matter. It includes horizons that have been eluviated of clay, iron, aluminum, with or without organic matter (Ae).

B—A mineral horizon or horizons characterized by an illuvial enrichment (exclusive of dolomite or salts more soluble in water) of silicate clay, iron, aluminum, or organic matter (Bt, Bf, Bh, Bfh).

C—A mineral horizon or horizons comparatively unaffected by the pedogenic processes operative in A and B, excepting (1) the process of gleying and (2) the accumulation of dolomite and salts more soluble in water (Ck, Cs, Cg and C).

Subhorizons

c—A cemented (irreversible) pedogenic horizon.

e—A horizon characterized by the removal of clay, iron, aluminum or organic matter. Usually lighter colored than the layer below (eluviated).

f—A horizon enriched with hydrated iron. It has a chroma of 3 or more and is redder than the horizon above or below.

g—A horizon characterized by reduction and gray colors; often mottled (gley).

h—A horizon enriched with organic matter. It must show at least one Munsell unit of value darker than the layer immediately below. When used as the only suffix to B (Bh) this horizon must contain 10 per cent or more of organic matter.

j—A horizon whose characteristics are weakly expressed (juvenile).

Humic Podzol Great Group

Soils with thick organic surface horizons (L-H), a light colored eluvial horizon (Ae), and an illuvial horizon (Bh) in which organic matter is the main accumulation product. The Bh is at least two inches thick and contains 10 per cent or more of organic matter; it generally has a color of (5 YR 3/3) or darker. It may be underlain by a Bfh or Bf horizon. The degree of base saturation of the solum is very low and cation exchange capacity of Bh is very high.

Orthic Humic Podzol

A soil with a Bh horizon containing free iron, as well as 10 per cent or more of organic matter, and underlain by a Bfh horizon containing less than 10 per cent organic matter. The Bh and Bfh horizons may be friable or cemented and may be underlain by thin, vitreous, dark reddish brown, impervious hardpan.

Profile: L, F, H, Ae, Bh, Bfh, C.

Gleyed Humic Podzol

A soil with a profile similar to that of an Orthic Humic Podzol except that it is mottled or splotched with iron or organic matter or both in the Ae and B horizons due to periodic wetness.

Profiles: L, F, H, Aeg (ABg), Bhg, C.
L, F, H, Aeg, Bhg, Bhfg, C.

Podzol Great Group

Soils that, undisturbed, have organic surface horizon or horizons (L-H), a light colored eluvial horizon (Ae), and an illuvial B horizon (Bf or Bfh) in which organic matter and sesquioxides are the main accumulating products. The main B horizon contains less than 10 per cent organic matter but a thin (less than two inches thick) Bh horizon containing more than 10 per cent organic matter may be present immediately under the Ae. The solum is generally moderately to strongly unsaturated.

Orthic Podzol

Soils with organic surface horizon or horizons (L-H), a light colored eluvial horizon (Ae) more than one inch thick and a friable Bfh or Bf horizon of high chroma. A Bh subhorizon containing more than 10 per cent organic matter is lacking or less than two inches thick.

Profile: L, H, Ae, (Bh), Bfh or Bf, C.

Eluviated Gleysol Great Group

Soils with organic horizons (12 inches thick) or with an Ah horizon or with both, but with a mottled Aeg horizon and a mottled Bg horizon. These soils have developed under grasses, sedges and swamp forest.

MAPS
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